

SEMICONDUCTOR DEVICE WITH A NEGATIVE VOLTAGE REGULATOR

Abstract

A semiconductor device includes a negative voltage regulator capable of regulating a negative input voltage and outputting a negative output voltage at an output node. The negative voltage regulator has a driver for adjusting the negative output voltage, a first operational amplifier for outputting a driving voltage for controlling a current on a first transistor included in the driver according to a feedback voltage and a reference voltage, a second operational amplifier for outputting a driving voltage for controlling a current of a second transistor, a current source circuit having two triple-well NMOS transistors for providing the driver a current, and a voltage potential divider for generating the feedback voltage by dividing potentials of a voltage source and the negative output voltage and outputting the feedback voltage to the first operational amplifier and the second operational amplifier for adjusting the currents of the first and second transistors thereby regulating the negative output voltage.